**Concise Critical Notes: Articles and papers**

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| Name of author(s) | Jacob T. Biehl and Brian P. Bailey | | |
| Full title of article | Improving Scalability and Awareness in Iconic Interfaces  for Multiple-Device Environments | | |
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| Hypothesis: What is the paper setting out to prove? Are research hypotheses supported? | The author states that there is no system to solve complex design problems where users can exchange design artifacts between personal devices, propagation artifacts on shared screens for later review and comparison, and generate new ideas together.  the authors have compared similar systems that have failed or not completed. | | |
| What is the theoretical position underlying the research? Type of theory? | The aim is to create a multi-device environment. Which is claimed would greatly help the simultaneous work of several devices and people in a local environment. The article explains that the whole system is based on research that managed to affirm that this benefits a lot as well as the correct way is developed. | | |
| What is the key literature used as background to the article or paper? | Bederson, B.B., J. Grosjean and J. Meyer. Toolkit Design for Interactive Structured Graphics. IEEE Transactions on Software Engineering, 30 (8), 535-546, 2004.  [2] Biehl, J.T. and B.P. Bailey. ARIS: An Interface for Application Relocation in an Interactive Space. Proceedings of Graphics Interface, 2004, 107-116. [3] Biehl, J.T. and B.P. Bailey. A Toolset for Constructing and Supporting Iconic Interfaces for Interactive Workspaces. Proc. INTERACT, 2005, 699-712.  [4] Chang, B. and D. Ungar. Animation: From Cartoons to the User Interface. UIST, 1993, 45-55.  [5] Endsley, M.R. Direct Measurement of Situation Awareness: Validity and Use of SAGAT. in Endsley, M.R. and Garland, D.J. eds. Situation Awareness Analysis and Measurement, Lawrence Erlbaum Associates, Mahwah, NJ, 2000, 147-174. | | |
| Which research methods are used? | They have done repetitive tests buying the use that people have with the system also the way to behave and work faster with their peers and the available devices.  When a user arrived, the activities were explained, the first interface was demonstrated, and the user practiced using it. The user performed the organizing activity in the low clutter condition (4 applications, 1 per screen) and then performed a similar activity in the high clutter condition (11 applications, 2-4 per screen). The user was asked to perform the activities as quickly as possible. Upon completion, the user filled out a questionnaire. This process was repeated for the second interface, using a counter-balanced order. Camtasia was used to record a user’s on-screen interaction. | | |
| What kind of sample is used? | He gives the example that it is impossible for a user to move quickly between the available devices and share the information of these with their colleagues as well as share ideas quickly. | | |
| Key results | Existing implementations of iconic interfaces scale poorly for  large numbers of applications and do not allow users to maintain  adequate awareness of the workspace. This paper demonstrated  how zooming and animation-based interactions could be used to  improve scalability and how application icons and portal views  with real-time updates could be used to enhance awareness. | | |
| Key conclusions or recommendations | Results from a user study confirmed the improved efficacy of  these techniques. These interaction techniques can be used to  improve the broader class of iconic and portal-based interfaces. | | |
| **Strengths of the research**  - How does it advance our understanding of the subject or how to research it?  - Are there appropriate hypotheses, methods to test the hypotheses, sample sizes or types, controls for variables, recommendations?  - Considerations of ethics? | Overall, the empirical results confirm that our new interaction techniques have made significant strides towards meeting our goals of improving scalability and enhancing awareness. These techniques advance the use of iconic interfaces for managing applications in MDEs.  The methods and metrics to test these hypotheses are the response time of the user to perform tasks as well as pair them with other people through other devices in a local environment which comparing time and interaction with humans has been corroborated a marked improvement. | | |
| **Weaknesses of the research:**  - In what ways is it limited? When and where would it not apply?  - What are the flaws in the research, in the hypotheses, research design and methods, sample size and type, conclusions drawn on the basis of the results? | Points to improve.  Improve scalability. Users must be able to better interact with representations when they are fully or partially occluded due to the clutter of an active working context, i.e., many applications are open. Scalability also includes being able to interact with small representations of applications when using a mouse, stylus, or touch screen, all of which are common in MDEs.  Provide better awareness of the workspace. This includes communicating which task artifacts (applications) are being viewed, which artifacts are on which screens, when a switch is made, etc. These cues are important for co-located groups [18], but absent from most management interfaces for MDEs. | | |